Abstract of the Disclosure

A method of controlling data transmission in an Ethernet passive optical network (EPON) and an apparatus thereof are provided. Transmission permission messages using a mode of bandwidth allocation are queued in a queuing unit according to the types of the transmission permission messages. A transmission time duration of upstream data is defined for each of the transmission permission messages queued in the queuing unit. A bandwidth allocation unit generates transmission permission messages to allocate upstream data transmission bandwidth for an optical network unit (ONU), based on the transmission permission messages stored in the storage unit. A scheduler designates the predetermined priority, reads transmission permission messages from queues according to a predetermined priority, determines a transmission start time of upstream data, and outputs the transmission permission messages.